US009638318B2

(12) **United States Patent**
Sasaki et al.

(10) **Patent No.: US 9,638,318 B2**
(45) **Date of Patent: May 2, 2017**

(54) **CONTROL DEVICE FOR CONTINUOUSLY VARIABLE TRANSMISSION**

(71) Applicants: **JATCO Ltd**, Fuji-shi, Shizuoka (JP); **NISSAN MOTOR CO., LTD.**, Yokohama-shi, Kanagawa (JP)

(72) Inventors: **Kiyofumi Sasaki**, Fuji (JP); **Youji Itou**, Sagamihara (JP)

(73) Assignees: **JATCO Ltd**, Fuji-Shi (JP); **NISSAN MOTOR CO., LTD.**, Yokohama-Shi (JP)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **15/023,180**

(22) PCT Filed: **Oct. 17, 2014**

(86) PCT No.: **PCT/JP2014/077632**
§ 371 (c)(1),
(2) Date: **Mar. 18, 2016**

(87) PCT Pub. No.: **WO2015/076041**
PCT Pub. Date: **May 28, 2015**

(65) **Prior Publication Data**

US 2016/0230886 A1 Aug. 11, 2016

(30) **Foreign Application Priority Data**

Nov. 22, 2013 (JP) 2013-241424

(51) **Int. Cl.**
F16H 55/56 (2006.01)
F16H 61/662 (2006.01)
(Continued)

(52) **U.S. Cl.**
CPC ***F16H 61/662*** (2013.01); ***F16H 59/44*** (2013.01); *F16H 2059/446* (2013.01); *F16H 2059/465* (2013.01); *F16H 2061/6629* (2013.01)

(58) **Field of Classification Search**
CPC F16H 61/66272; F16H 2059/465; F16H 61/6649; Y10T 477/6237; Y10T 477/624
(Continued)

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,619,629 A * 10/1986 Shigematsu B60W 30/18 474/18
4,759,212 A * 7/1988 Sawada G01P 21/02 73/115.02
(Continued)

FOREIGN PATENT DOCUMENTS

JP 62-068142 A 3/1987
JP 62-137454 A 6/1987
JP 2004-124968 A 4/2004

Primary Examiner — Henry Liu
(74) *Attorney, Agent, or Firm* — Foley & Lardner LLP

(57) **ABSTRACT**

There are provided a continuously variable transmission (CVT) in which a belt (**7**) is wound around a primary pulley (**5**) and a secondary pulley (**6**) to transmit power; a primary pulley rotational speed sensor (**13**) for detecting a rotational speed of the primary pulley (**5**); a vehicle stopped state determination means for determining whether a vehicle is in a stopped state; a belt slippage detection means for detecting belt slippage on the basis of a signal of the primary pulley rotational speed sensor (**13**); and a prohibition means for prohibiting detection of the belt slippage by the belt slippage detection means when a parking range or a neutral range is selected by a shift lever operation by a driver. In the vehicle stopped state during selection of the parking range or the neutral range, the rotational speed of the primary pulley (**5**) is not basically output, and the belt slippage does not occur.
(Continued)